Global Nexus Institute

Innovation & Excellence

Professional Data science & Artificial Intelligence

The Global Nexus Institute is dedicated to transforming the lives of talented individuals by equipping them with modern, relevant skills necessary for success in today's data-driven world.

Our Mission

To provide high-quality, accessible education that bridges local needs with global opportunities, creating pathways to employment, innovation, and societal impact.

Our Vision

To be a transformative institution that empowers the next generation of leaders, innovators, and professionals in technology and data sciences across Africa and beyond.

Why Data Science?

Data science is one of the most sought-after skill sets in the 21st century, often referred to as the "sexiest profession" by Harvard Business Review. The field harnesses vast amounts of data generated every minute, utilizing powerful processing capabilities and open-source algorithms to solve complex problems.

The demand for data scientists is driven by four megatrends:

- Cloud Efficiency: Cost-effective storage solutions for vast quantities of data.
- Increased Processing Power: Exponential growth in computer processing capabilities.
- Open-Source Algorithms: Accessibility of powerful algorithms for data manipulation.
- Big Data: The continuous generation of large volumes of data.

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Who Is This Course For?

- This course is ideal for individuals who wish to enhance their skills or transition into the field of data science. It caters to:
- Newcomers; those looking to fill gaps in their analytical knowledge.
- Professionals Seeking Upskilling: Individuals from various industries wanting to future-proof their careers with modern data techniques.
- Recent Graduates or Career Changers: Those intrigued by technology and looking for a career in data science.

Requirements

To enroll in the Global Nexus Institute's Data Science course and Artificial Intelligence, Business Data Analytics, or Computing & Data Science, participants must meet the following requirements:

Basic Requirements

- Basic computer literacy (using a web browser, operating an email account, spreadsheets, etc.).
- Access to a computer, the internet, and software.
- Access to Google office productivity apps (Docs, Sheets, Slides) or Microsoft Office apps (Word, Excel, PowerPoint).
- Google Chrome or any popular browser to access the learning management system.

Technical Requirements:

- Operating System: Windows 10 recommended (Windows 7 minimum) for Power BI; MacOS running Parallels for Windows will also suffice.
- Processor: Minimum i3 with a clock speed of 2 GHz.
- RAM: Minimum 4 GB.
- Internet Speed: A minimum line speed of 10 Mbps and 20 GB of data per month.
- Communication Communication Hardware: Webcam and microphone.

Additional Requirements:

- Familiarity with platforms like Google, YouTube, and DataCamp may be necessary as these services are used throughout the course.
- A basic understanding of mathematics and statistics is recommended.
- Basic knowledge of at least one programming language is beneficial but not required.

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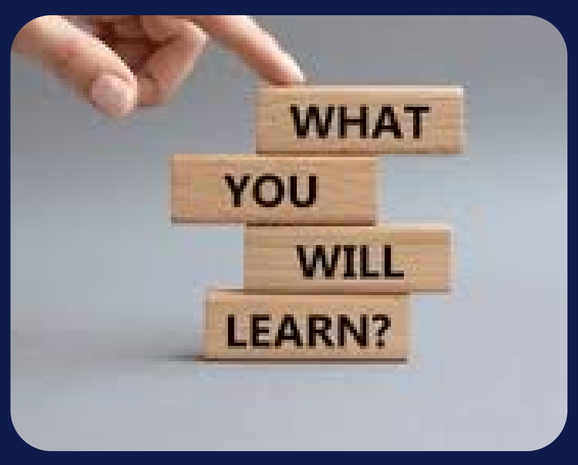

What to Expect from Your Learning

The course is structured into manageable weekly units called lessons.

Students will engage through:

- Real-time chat platforms and forums.
- Interactive content including video lectures, coding assignment, oral presentation.
- Practical assignments and quizzes that reinforce learning through real-world applications.

Course Curriculum Overview

Global Nexus Institute offers a comprehensive data science program, covering PowerBI for Data Visualization, Python Programming, and SQL for Data Analysis. Students learn Supervised and Unsupervised Machine Learning to analyze and model data, along with Natural Language Processing & AI for working with language data. The program concludes with Data Science Projects, allowing students to apply their skills to real-world challenges, ensuring they are job-ready and equipped to contribute to the tech industry.

Module	Duration (Weeks)	Time in Hours
Global Nexus Institue Philosopy	1	30
PowerBI for Data Visualization	4	120
Python Programming	6	180
SQL for Data Analysis	4	120
Supervised Machine Learning	4	120
Natural Language Processing & AI	5	150
Unsupervised Learning	4	120
Data Science Projects	4	60
Total	32	900

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Introduction to Professional DS & AI

The Professional Data Science & AI course at **Global Nexus Institute** offers a comprehensive curriculum designed to provide both theoretical knowledge and practical skills needed to succeed in the field of data science. With a focus on real-world applications, this 8-month program covers a wide range of tools, techniques, and concepts. Below is a detailed breakdown of the course modules:

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Course Overview

- Duration: 8 months
- Prerequisites: A basic analytical background. Familiarity with programming is helpful
- Tools Learned: Python, Jupyter Notebooks, Excel, Github, MySQL, Power BI, Scikit-learn.

Curriculum Breakdown

1. Global Nexus Institute Introduction (1 week)

- **Orientation**: Familiarize yourself with the learning environment and platform.
- **Problem-solving Concepts**: Understand the principles of mutually exclusive and collectively exhaustive statements.
- **Data Product Framework**: Learn how to define problem statements and navigate the solution landscape.
- **Ways of Work:** Introduction to business and systems theory fundamentals.

2. Power BI for Data Visualization (4 weeks)

- **Data in Power BI:** Learn how to load datasets, clean data, and create calculated columns using DAX.
- **Visuals in Power BI:** Master numeric visuals (cards, tables) and graphic visuals (charts).
- **Dashboards:** Plan, design, and prototype interactive dashboards.
- **Visual Storytelling:** Learn the techniques for telling compelling stories through data visuals.

3. Python Programming (6 weeks)

- **Python Basics:** Get hands-on experience working in a Jupyter Notebook environment; understand pseudo code and debugging practices.
- **Functions and Control Flow:** Learn how to create functions, use conditional statements, and implement loops in Python.
- **Data Structures:** Deep dive into lists, tuples, sets, dictionaries, and DataFrames in Pandas.
- **Exploratory Data Analysis:** Gain insights into statistical measures, probabilities, hypothesis testing, and advanced visual analysis techniques.

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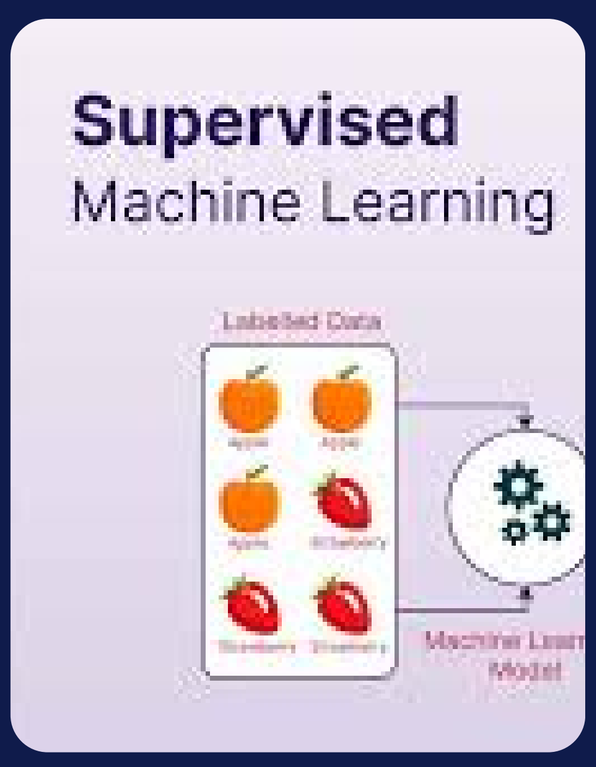
4. SQL for Data Analysis (4 weeks)

- **Introduction to SQL:** Understand the basics of working with databases, SQL data types, and calculations.
- **Relational Database Design:** Learn about SQL schemas, entity relationships, and normalization principles.
- **SQL in Practice:** Explore set theory applications, SQL joins, and nested queries for efficient data retrieval.
- **Data Manipulation:** Master data cleaning techniques and handling numeric, time, and string data types.

5. Supervised Machine Learning (4 weeks)



- **Building a Model:** Learn the statistical learning concepts involved in building models, including accuracy testing.
- **Preparing Data for Modeling:** Understand feature engineering techniques and data scaling/standardization methods.
- **Algorithms for Regression Models:** Explore models like K-nearest neighbors, decision trees, random forests, and support vector machines.
- **Model Tuning:** Learn about performance metrics, the bias vs. variance trade-off, and hyperparameter tuning strategies.

6. Natural Language Processing (NLP) and AI (4 weeks)

- **Introduction to genAI and LLMs:** Understand: AI and LLMs revolutionize industries, enhancing automation and innovation.
- **Overview of NLP and AI:** Understand techniques for text preprocessing, including punctuation removal and tokenization.
- **Analyzing Text:** Implement lemmatization, bag-of-words models, and conduct sentiment analysis.
- **Basic Classification Techniques:** Apply logistic regression and evaluate model outputs using confusion matrices.
- **Advanced Classification Techniques:** Learn about hyperparameter tuning, dealing with imbalanced datasets, and an introduction to neural networks.

7. Unsupervised Machine Learning (4 weeks)

- **Dimensionality Reduction:** Understand techniques like Principal Component Analysis (PCA) and multidimensional scaling methods.
- **Clustering Methods**: Learn about K-means clustering, hierarchical clustering, and Gaussian mixture models for soft clustering.
- **Recommender Systems:** Explore methods like product similarity measures and compare content-based vs. collaborative filtering.

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8. Data Science Projects (4 Weeks)

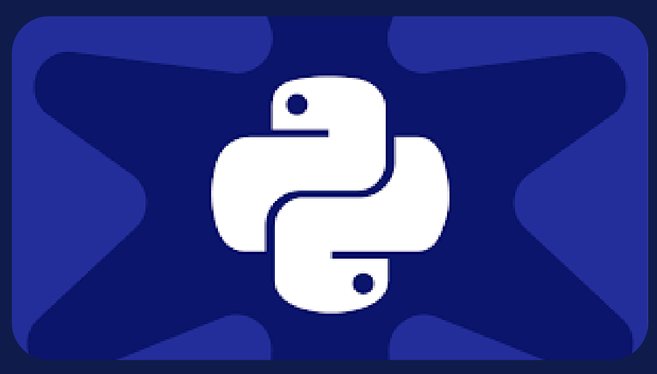
- **Introduction to SQL:** Understand the basics of working with databases, SQL data types, and calculations.
- **Relational Database Design:** Learn about SQL schemas, entity relationships, and normalization principles.
- **SQL in Practice:** Explore set theory applications, SQL joins, and nested queries for efficient data retrieval.
- **Data Manipulation:** Master data cleaning techniques and handling numeric, time, and string data types.

Course Highlights

- This curriculum integrates both foundational knowledge and hands-on experience, preparing students to enter the data science field with a solid understanding of:
- Data analysis and visualization using Power BI and Python.
- Structured querying and manipulation of data with SQL.
- Machine learning techniques for predictive modeling and classification.
- Natural Language Processing (NLP) and unsupervised learning methods for pattern recognition and recommendation systems.
- By the end of the course, students will have the tools and skills necessary to pursue careers in data science, equipped to solve complex problems, visualize data, and develop AI models for real-world applications.

The Professional Data Science & AI course provides an enriching learning experience with a clear emphasis on practical skills, ensuring students are job-ready upon completion.

Data Science Tools



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